Current Status of Claims

1   1.(**currently amended**)   A method of improving coronary calcium imaging-based cardiac risk

2   assessment comprising:

3   a.   scanning a region of interest in a patient using computed tomography (CT);

4   b.   storing CT generated data resulting from ~~said~~ <u>the</u> scanning, the data comprising

5   ~~calcification data as~~ CT generated images;

6   c.   analyzing the CT generated images to determine a location, ~~heterogeneity,~~ shape,

7   size, ~~texture,~~ and density ~~gradient~~ of each calcified spot in a patient's heart;

8   d.   analyzing the CT generated images to determine a ~~scatterness~~ <u>distribution</u> ~~and a~~

9   pattern of the ~~multiple~~ calcified spots;

10   e.   defining a risk score based on the analyzing step c and/or the analyzing step d; and

11   f.   assessing a patient's risk of cardiovascular disease based upon the risk score.

2.(**canceled**)
3.(**canceled**)
4.(**canceled**)
5.(**canceled**)
6.(**canceled**)
7.(**canceled**)
8.(**canceled**)
9.(**canceled**)
10.(**canceled**)
11.(**canceled**)
12.(**canceled**)
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31.(**canceled**)
32.(**canceled**)
33.(**canceled**)
34.(**canceled**)

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1   35.(**previously presented**)   The method of claim 1, further comprising

2   g.   categorizing an area of an abrupt change in regional coronary elasticity as a high-risk

3   region.

1   36.(**currently amended**)   The method of claim 1, <u>further comprising:</u>

2   <u>determining</u> ~~wherein each location comprises a distance from a base or apex of the patient's~~

3   ~~heart and~~ proximal ~~or~~ <u>and</u> distal <u>artery calcification</u> ~~segment of coronary arteries~~.

1   37.(**currently amended**)   The method of claim 1, <u>wherein the first analyzing step further</u>

2   <u>determines a change in density of each calcified spot from the CT generated images</u> ~~wherein each~~

3   ~~heterogeneity comprises variance in calcium densities with its spot~~.

1   38.(**currently amended**)   The method of claim 1, wherein each shape comprises a ~~circular or~~

2   ~~angular spot having~~ concentric or eccentric character.

1   39.(**currently amended**)   The method of claim ~~1~~<u>37</u>, <u>further comprising:</u>

2   <u>relating differing density of each calcified stop to an area of abrupt change in a regional</u>

3   <u>coronary elasticity</u> ~~wherein each texture comprises a smooth or rough texture~~.

1   40.(**canceled**)

1   41.(**currently amended**)   The method of claim 1, <u>further comprising:</u>

2   <u>determining a distribution of calcification in multiple coronary arteries</u> ~~wherein the~~

3   ~~scatterness comprise interspot distance and the pattern comprises variance of calcium densities~~

4   ~~among two or more spots~~.

1   42.(**previously presented**)   The methods of claim 1, wherein the CT generated images are

2   generated by electron beam computed tomography (EBCT) or multi-detector spiral CT (MDCT).

1   ~~42~~<u>43</u>.(**previously presented**)   The methods of claim 1, wherein the analyzing steps utilizes

2   statistical determinants including mean, median, mode, standard deviation, range, coefficient of

3   variation, skew, or kurtosis, or a combination thereof.

1   ~~43~~<u>44</u>.(**currently amended**)   A method for improving coronary calcium imaging-based cardiac risk

2   assessment comprising:

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3	a.	scanning a ~~region of interest~~ <u>plurality of sections of coronary arteries</u> in a patient
4		using computed tomography (CT) at a first time;
5	b.	storing first CT generated data resulting from the ~~first~~ scanning, the data comprising
6		~~calcification data as~~ first CT generated images;
7	c.	~~later~~ scanning ~~a region of interest in a patient~~ <u>the plurality of sections of the coronary</u>
8		<u>arteries in the patient</u> using <u>the</u> computed tomography (CT) at ~~at least one later~~ <u>a</u>
9		<u>second</u> time;
10	d.	storing ~~later~~ <u>second</u> CT generated data resulting from the ~~later~~ <u>second</u> scanning, the
11		data comprising ~~calcification data as later~~ <u>second</u> CT generated images;
12	<u>c</u>~~c~~e.	analyzing the ~~two or more sets of~~ <u>first and second</u> CT generated images ~~of a patient~~
13		~~obtained at the two or more times~~ to determine ~~changes in~~ a location, ~~a heterogeneity,~~
14		a shape, a size, ~~a texture, and~~ a density <u>and a change in density</u> ~~gradient~~ of each
15		calcified spot in the ~~patient's heart~~ <u>coronary arteries at the two times</u>;
16	<u>d</u>	<u>forming first and second maps of the plurality of sections of the coronary arteries as</u>
17		<u>a function of the statistical distribution of the shape, the size, the density and the</u>
18		<u>change in density of the calcified spots in each of the sections of the first and second</u>
19		<u>CT generated images;</u>
20	<u>e</u>~~e~~f.	~~analyzing the two or more sets of CT generated images of the patient obtained at the~~
21		~~two or more time points to determine changes in a scatterness and a pattern of~~
22		~~multiple calcified spots~~ <u>using the maps to determine a progression of plaque</u>;
23	<u>f</u>~~f~~g.	defining a risk score based the analyzing step ~~e~~ <u>c, the forming step d</u> and/or the
24		~~analyzing~~ <u>using</u> step ~~f~~<u>e</u>; and
25	<u>g</u>~~g~~h.	assessing a patient's risk of cardiovascular disease based upon the risk score.

1	~~44~~<u>45</u>.**(currently amended)**	The method of claim 43, further comprising
2	e.	using the changes in ~~calcification~~ density <u>of the calcified spots</u>~~, heterogeneity, shape,~~
3		~~size, texture, and density gradient~~ to assess the patient's risk of cardiovascular
4		disease by relating the changes in <u>density of the</u> calcified spots to an outcome of a
5		lesion.

1	46.**(previously presented)** The methods of claim 43, wherein the analyzing steps utilizes
2	statistical determinants including mean, median, mode, standard deviation, range, coefficient of
3	variation, skew, or kurtosis, or a combination thereof.

1	47.**(previously presented)** The method of claim 43, <u>further comprising:</u>
2	<u>determining</u> ~~wherein each location comprises a distance from a base or apex of the patient's~~

3   ~~heart and~~ proximal ~~or~~ <u>and</u> distal <u>artery calcification</u> ~~segment of coronary arteries~~

1   48.**(canceled)**

1   49.**(currently amended)**   The method of claim 43, wherein each shape comprises ~~a circular or~~

2   ~~angular spot having~~ concentric or eccentric character.

1   50.**(previously presented)**   The method of claim 43, <u>further comprising:</u>

2   <u>relating a differing density of each calcified stop to an area of abrupt change in a regional</u>

3   <u>coronary elasticity</u> ~~wherein each texture comprises a smooth or rough texture~~.

1   51.**(canceled)**

1   52.**(previously presented)**   The method of claim 43, <u>further comprising:</u>

2   <u>determining a distribution of calcification in multiple coronary arteries</u> ~~wherein the~~

3   ~~scatterness comprise interspot distance and the pattern comprises variance of calcium densities~~

4   ~~among two or more spots~~.

1   53.**(previously presented)**   A method of mapping comprising:

2   forming a map of a plurality of sections of coronary vessels as a function of the statistical

3   distribution of ~~heterogeneity,~~ shape, size, ~~texture, and~~ density <u>and changes of density</u> ~~gradient~~ of

4   calcified spots in each sections, where the map is used to determine a progression of plaque and to

5   categorize a patient's risk of cardiovascular disease.